

THREE NEW MYGALOMORPH SPIDER GENERA FROM THAILAND AND CHINA (ARAENAE)

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Three new mygalomorph genera and four new species are described: *Angka* gen. nov., *Angka hexops* sp. nov., a cyrtaucheniid from Thailand; nemesiids, *Sinopesa* gen. nov., *Sinopesa maculata* sp. nov., from Thailand and *Sinopesa guangxi* sp. nov. from China; and a diplurid, *Leptothele* gen. nov., *L. bencha* sp. nov., from Thailand. Generic limits, cladistic assessments and systematic placements within the 3 families are discussed; notes on natural history are given. A character initially considered diagnostic in *Phyxioschema suthepium* Raven & Schwendinger is shown to be variable. □ *Mygalomorphae*, *Angka*, *Sinopesa*, *Leptothele*, China, Thailand.

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In biodiversity studies, it is customary to compare faunal diversities of regions and countries with one another. Judged by an early catalogue of spiders (e.g. Roewer, 1942), the mygalomorph fauna of Thailand has been poorly represented (2 theraphosids and 1 atypid). The reasons are historical. Early arachnologists focused their collecting efforts on British and other European colonies. The protracted absence of harsh western techniques for land use no doubt ensured that the biodiversity of Thailand was not so heavily affected until World War II but equally it was little known. The prolonged absence of a country so rich and diverse as Thailand from phylogenetic and biogeographic studies of spiders has led to significant weaknesses in such analyses. Wide discontinuities in both form and space invite explanations of rapid evolution in the known fauna, and the intrusion of major barriers and/or cataclysmic extinction. The effect, however, is probably no more detrimental than inadequately funded taxonomy in key regions like India, and was succinctly demonstrated in the New Zealand area by *Sphenodon* (Daugherty et al., 1990) where subspecies became extinct because of the limited taxonomic study on the genus.

This paper is one of several (by PJS with others) on the spiders of the rich forests of Thailand and highlights these points. The Aganippinae were thought to be highly specialised endemic Australian taxa (e.g. Main, 1981) with the closest relatives being the Indian genysine genus *Scalidognathus* Karsch, 1878 (Raven, 1985). The description of *Prothemmenops* Schwendinger, 1991 from Thailand removed the

mystery of that uniqueness and quickly bridged the gap. Here we address further exciting new species of initially uncertain taxonomic status discovered in Thailand. Relationships became clear by searching for sister taxa. For each species a new genus is established; in one, a new species from China is also included. The new taxa show new relationships among southeast Asian and Australian mygalomorphs.

MATERIALS AND METHODS

Abbreviations are standard for the Araneae and follow Raven (1994). Number of structures on the opposite body side are given in parentheses. Measurements, if not otherwise indicated, are in mm; total length includes chelicerae. Colour is described from alcohol preserved specimens unless noted. Museum Acronyms: MCZ, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts; MHNG, Muséum d'Histoire naturelle, Genève; NHMW, Naturhistorisches Museum, Wien; QM, Queensland Museum, Brisbane. Collectors: AP, A. Payne; PJS, P.J. Schwendinger.

SYSTEMATICS

Family CYRTAUCHENIIDAE Simon

RELATIONSHIPS

This group was given family status first by Raven (1985) who radically restructured the Mygalomorphae. Only Goloboff (1993) has since addressed the weaknesses of the family tenuously

constituted by Raven (1985). Goloboff's fine analysis used a rigorous method and exhaustive tested alternatives. Goloboff found only some of Raven's groups could be supported but that "Raven (1985) was impressively close to an optimal solution". However, Goloboff (1993) concluded that "the present results were too preliminary to warrant nomenclatural changes". Hence, the classification of Raven is followed here.

Angka gen. nov.

TYPE SPECIES

Angka hexops sp. nov.

DIAGNOSIS

Closely related to *Kiama* Main & Mascord, 1969 but only 6 eyes (Fig. 6I), a narrow fovea (Fig. 6A) and much smaller PMS (Fig. 6K).

Maxillae narrow, ventral surface not distended. Labium short; posterior sternal sigilla small, marginal. Legs armed with spines, also on dorsal tibiae and metatarsi of posterior legs. Legs of ♀ scopulate. Transverse ridges on trichobothrial bases confined to upper ledge (Fig. 4A). Tarsal organ low. Fcmlc with 2 rows of teeth on all paired claws (Fig. 3A, D). PMS very small. Metatarsi of ♂ leg I modified (Fig. 6H). Male palp with dorsal spines on tibia and tarsus; bulb with cork-screw-shaped embolus (Fig. 6C, D).

DESCRIPTION

Carapace wide, glabrous; cephalic part wide in front and moderately arched (Fig. 6A, F, J). Group of 6 eyes, not on tubercle, occupies 1/3-1/4 of head width at that point, no PME. Fovea slightly procurved, deep, transverse, narrow. Chelicera robust, with teeth only on promargin of fang groove; rastellum absent. Maxillae moderately wide, with flat ventral surface and few spin-

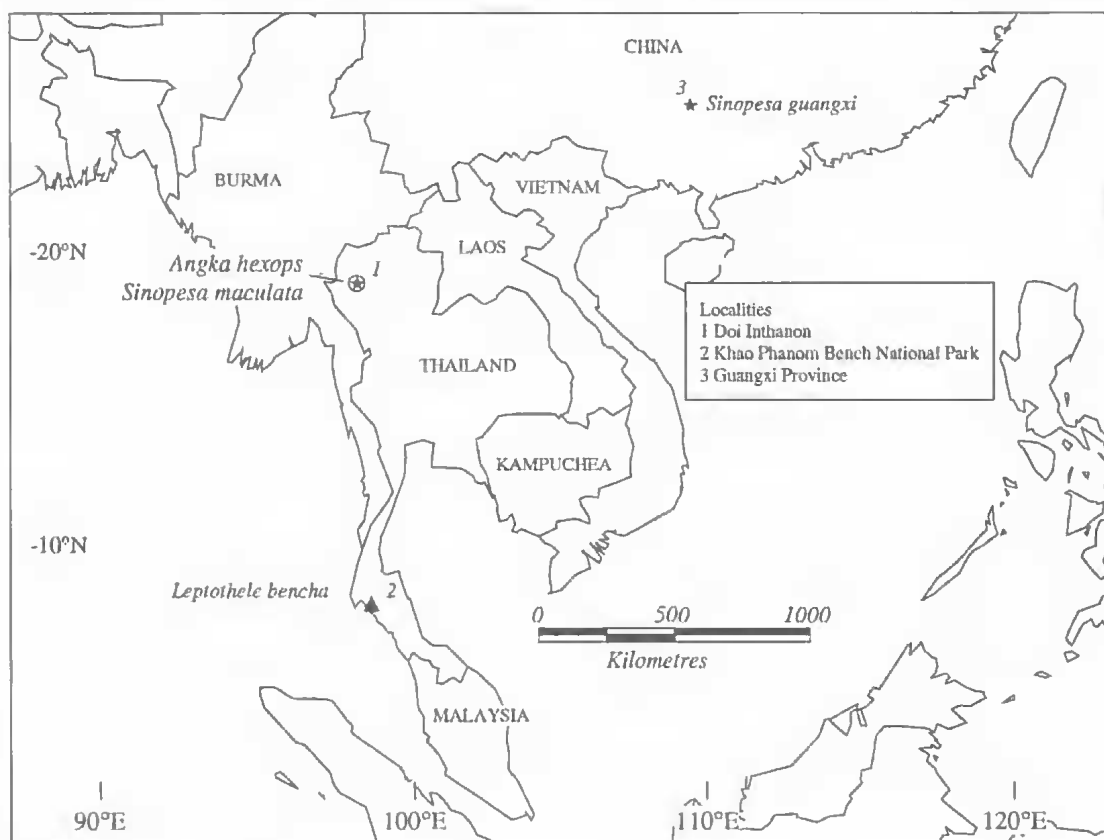


FIG. 1. Occurrence of *Angka hexops* sp. nov., *Leptothele bencha* sp. nov., *Sinopsea maculata* sp. nov. in Thailand and *S. guangxi* sp. nov. in China.



FIG 2. A-C. Habitus. A, B, *Angka hexops* sp. nov. A, juvenile ♂. B, ♀. C, *Leptothele bencha* sp. nov., ♀.

dle-shaped cuspules on probasal corner. Labium wide, short, no cuspules. Sternum almost as wide as long; labiosternal suture a broad groove; all sternal sigilla small, marginal. Legs long, slender; cuticle of distal leg segments with fine reticulated texture (Fig. 5B). Strong spines ventrally on all tibiae and metatarsi and on dorsal side of legs III, IV and on palpal tibia and tarsus. Leg tarsi aspinose. Scopula light on leg tarsi and distal metatarsi of I, II. No preening combs. Trichothorial collar with transverse ridges only along upper ledge (Fig. 5B). Tarsal organ low, with detached low mounds nearby (Fig. 4A). Paired tarsal claws with 2 rows of several long juxtaposed cylindrical teeth, less numerous and long on III, IV (Fig. 3A, D). Unpaired claw bare, short and hooked. Abdomen pale, no pattern. Booklung apertures with many setae on tissue just inside entrances. PMS very small; PLS long, apical joint digitiform. Pumkiniform spigots absent.

Male: strong spines but no coupling spur on tibia I (Fig. 6G); metatarsus I sigmoid, aspinose and narrowed in its basal half (Fig. 6B, G); bulb pyriform, with long slender corkscrew-shaped embolus (Fig. 6C, D). No intercheliceral tumescence.

Vulva with 2 spermathecae, each divided into two anterior lobes, the outer ones branching from the distal portion of the spermatheca and bent towards the anterior (Fig. 6L).

ETYMOLOGY

From the type locality, Doi Angka Luang, the old name of Doi Inthanon; *ang ka* Thai, meaning crow's bowl. (Doi = mountain, luang = large, great).

DISTRIBUTION

As for species.

INCLUDED SPECIES

Angka hexops sp. nov.

RELATIONSHIPS

The search for the sister group of *Angka* begins by eliminating alternatives. Several mygalomorph families have strong autapomorphies not present in *Angka*. Two possible families with close affinities are Nemesiidae and Cyrtachaeniidae. The arched cephalic area and reduced eye tubercle clearly associate *Angka* with the Cyrtachaeniidae. No nemesiids with such deep and rounded maxillae are known. The similarly elevated tarsal organs of *Kiama* (see Raven, 1981b and Fig. 5C) and *Angka* (Fig. 4A), the elevated caput and sessile eyes, the wide shape of the maxillae, and leg spination indicate they are sister groups. Differences between the two are not phylogenetically contradictory. The strongly procurved fovea of *Kiama* is plesiomorphic for the Rastelloidina (Raven, 1985) and its large sternal sigilla are simply autapomorphic. In both genera, the spermathecae are bilobed "1 + 1" (see Raven, 1985), ♂ lack a tibial spur, and the spiders are light coloured, not dark as for many burrowing mygalomorphs.

BIOGEOGRAPHY

Although *Angka* and the Australian *Kiama* are considered sister groups, the suggestion that their occurrence in Australia arose by invasions through New Guinea (e.g. according to Main, 1981, 1982, Queensland was invaded by idiopids,

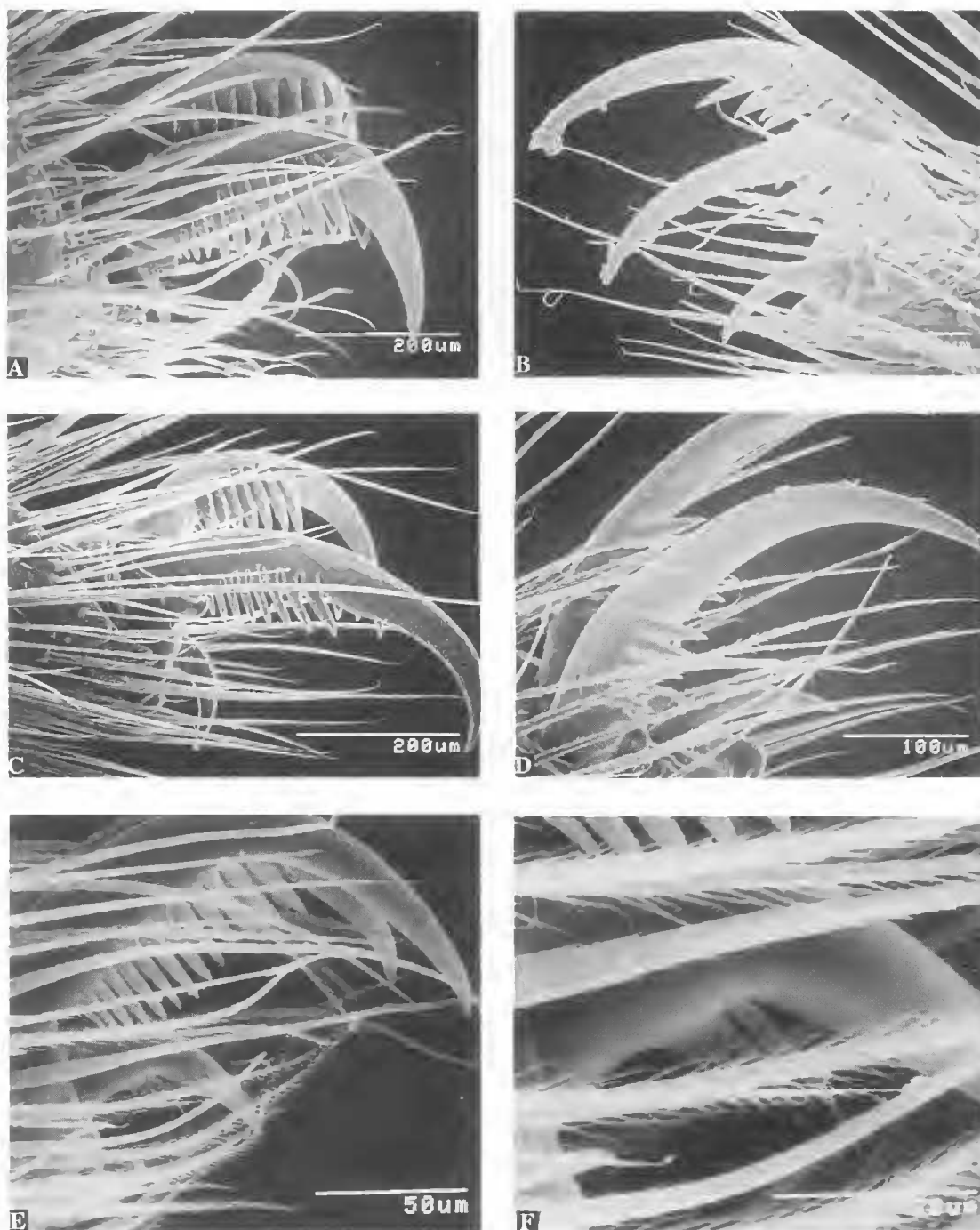


FIG. 3. A-F, Tarsal claws, lateral views. A, D, *Angka hexops* sp. nov. A, ♂, leg I. D, ♀, leg IV. B, C, *Sinopesa*. B, *S. maculata* sp. nov., ♂, leg IV. C, *S. guangxi* sp. nov., ♂, leg IV. E, F, *Leptothele bencha* sp. nov., ♀, leg I. E, all claws. F, unpaired claw.

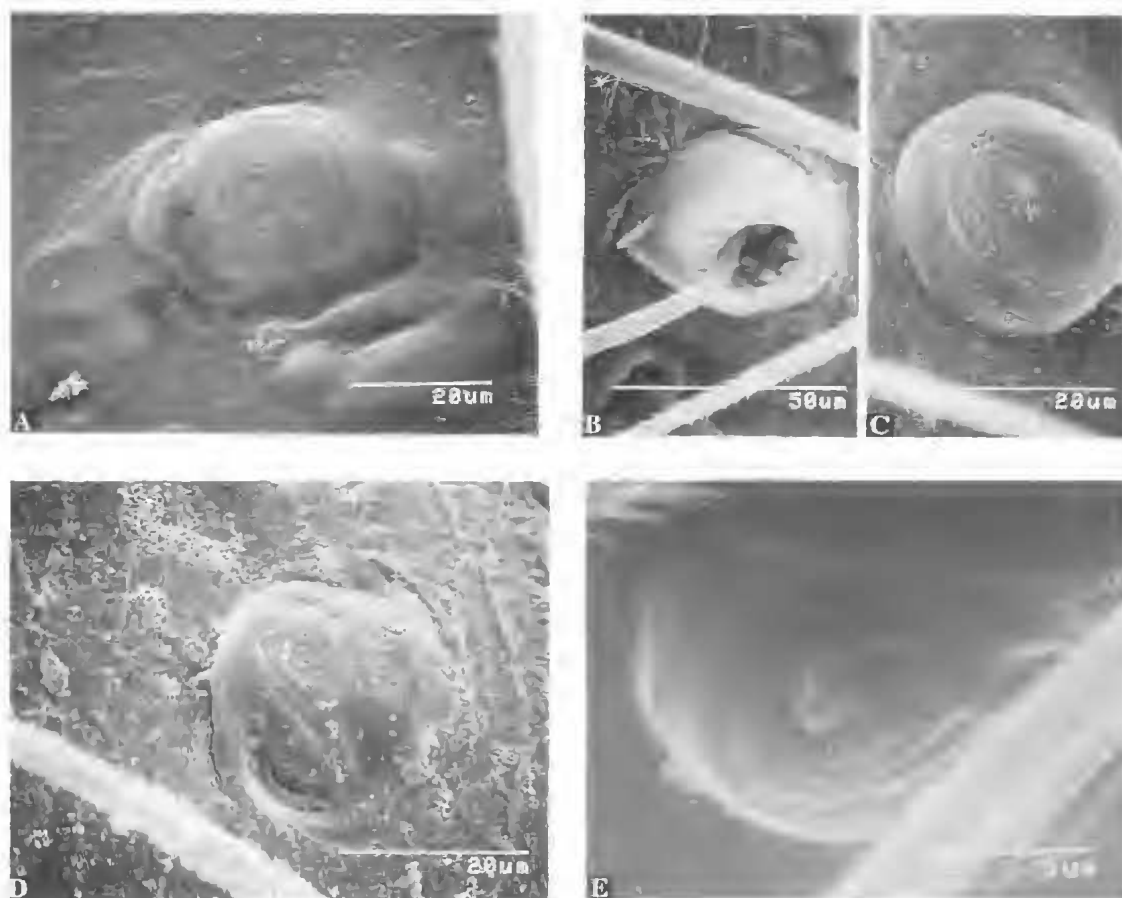


FIG. 4. A-E, tarsal organ, and trichobothrial base, dorsal views. A, *Angka hexops* sp. nov., ♂, leg I. B-D, *Sinopesa*. B, C, *S. guangxi* sp. nov., ♂, leg IV, B, trichobothrium and base, C, tarsal organ. D, *S. maculata* sp. nov., ♂, leg IV. E, *Leptothele bencha* sp. nov., ♀, leg I.

theraphosids, and some barychelids) lacks merit. The taxonomy, distributions, and family placements of mygalomorphs in Main (1982) were tentative and some were confused. Hexathelidae (notably the Atracinae) are not known from New Guinea. Main (1982) noted doubts in locality records of the Chevert Expedition (Rainbow, 1920). In fact, the combination of mygalomorph genera listed from Bradley's Chevert material is exactly that of his home suburb in Sydney, Australia.

Mygalomorph genera known from New Guinea are from Barychelidae (*Nihoia*, *Monodontium*; Raven, 1994), Ctenizidae (*Conothele*; Main, 1982), Dipluridae (*Masteria* Koch, 1873; Raven, 1979) or Theraphosidae (*Selenocosmia*, *Phlogiellus*, *Coremiocnemis*; Queensland Museum records). A similarly botanically diverse region as New Guinea is the Wet

Tropics World Heritage Area (WHA), in north-eastern Australia. Queensland Museum database records (unpublished) list 9 mygalomorph families and 24 genera from the Wet Tropics WHA: Actinopodidae (*Missulena*), Barychelidae (*Idiocris*, *Idiommatia*, *Mandjelia*, *Moruga*, *Ozicrypta*, *Trittame*, *Tungari*, *Zophorame*), Ctenizidae (*Conothele*), Dipluridae (*Cethegus*, *Masteria*, *Namireia*), Hexathelidae (*Hadronyche*), Idiopidae (*Cataxia*, *Homogona*, *Misgolas*), Migidae (*Migas*), Nemesiidae (*Aname*, *Chenistonia*, *Namea*) and Theraphosidae (*Phlogiellus*, *Selenocosmia*, *Selenotypus*). Hence, the known mygalomorph fauna of New Guinea can be regarded as depauperate. Also, the terrestrial component of New Guinea is geologically young, having been pushed up in the Oligocene by the collision of the Australian and Asian plates (Raven & Axelrod, 1972). The three most diverse

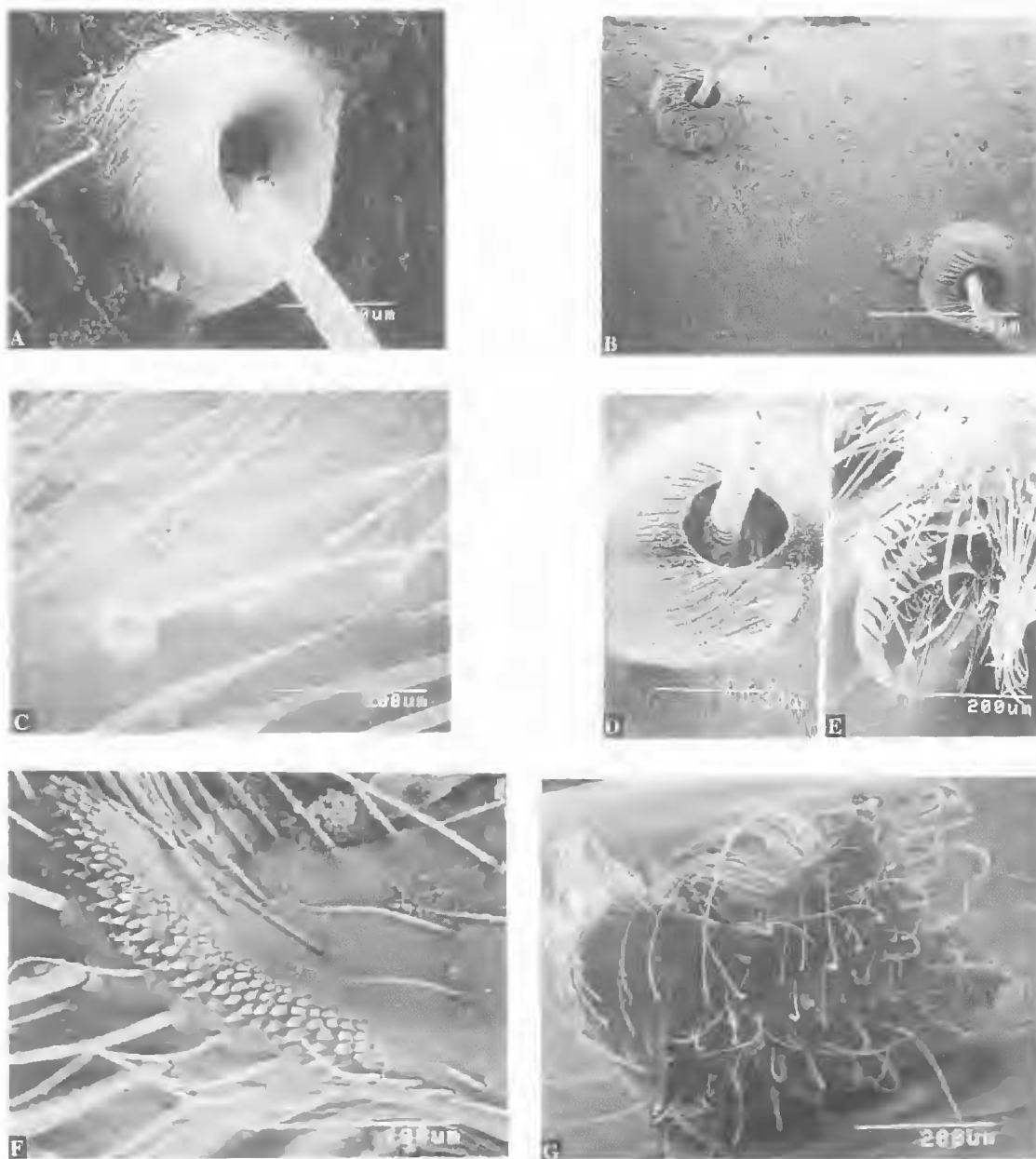


FIG. 5. A-G, trichobothrial base and cuticle, oblique dorsal view. A, C, *Kiama lachrymoides* Main & Mascord, ♂. A, trichobothrium & base. C, with tarsal organ & cuticle. B, *Angka hexops* sp. nov., ♂, leg I. D, E, *Acontius* species, ♂, D, leg I, trichobothrial base, dorsal view. E, claws, lateral view. F, G, *Leptothele bencha* sp. nov., F, serrula, axial view. G, maxilla, ventral view.

mygalomorph families in Australia (Idiopidae, Nemesiidae, Barychelidae) are either absent (Idiopidae, Nemesiidae) or far less diverse (Barychelidae: 3 genera vs 10 in Eastern Australia). Significantly, Idiopidae and Nemesiidae occur west of Wallace's Line but not east until

Australia. Equally, few Australian mygalomorphs show affinities with Oriental taxa indicative of dispersal. Large Australian theraphosids of the genera *Selenocosmia* and *Phlogiellus* are widespread through northern Australia and are found also in New Guinea, parts

of the Pacific and southeast Asia. The enigmatic minute litter mygalomorph *Masteria* is known from the Philippines, through the Pacific (northern Australia, New Guinea, Fiji, and New Caledonia) to South and Central America (Raven, 1979, 1991). The group probably predates the breakup of Gondwanaland. The ctenizid *Conothele* occurs through the western Pacific and much of northern Australia. In the Australian Barychelidae (Raven, 1994), only the Indo-Pacific genera *Sason* and *Idioctis* (Raven, 1986, 1988) occur on both sides of Wallace's line.

One alternative for this widely split distribution of the Cyrtaucheniidae lies in India's northward raft carrying part of the fauna including the ancestral sister group of both *Kiama* and *Angka*. After the separation, each genus diverged.

***Angka hexops* sp. nov.**

(Figs 1, 2A, B, 3A, D, 4A, 5B, 6)

MATERIAL EXAMINED

HOLOTYPE: QMS4167, ♂, Doi Inthanon, 18°33'N, 98°28'E, 2530m altitude, Chiang Mai Province, Thailand, 18 Apr-23 May 1987, PJS.

PARATYPES: QMS29274, same data as holotype: 9 ♂♂, 1 ♀, 1 penultimate ♂, 13 Jan 1993, MHNG, NHMW.

ETYMOLOGY

Greek, *hexa* (six), and *ops* (eye).

DIAGNOSIS

As for genus.

DESCRIPTION

Holotype male QMS4167: Total length, 12.5. Carapace 5.2 long, 4.9 wide. Abdomen 5.6 long, 3.7 wide.

Carapace orange brown, chelicerae, palps and leg I red brown, other legs orange brown. Abdomen entirely pallid yellow brown, posterior lung covers with tiny dark patches at bases of setae.

Carapace broad with many long brown bristles on lateral and posterior margins, posterior interstitial ridges, in foveal region, along anteromedial ridge, on clypeus, between PME, and on caput behind eye group. Pars cephalica broad, arched. Fovea deep, slightly procurved, 0.94 wide, occupies ca. 1/5 of carapace width at that point. Clypeus very narrow, 0.25 wide.

Eyes six, PME absent, lateral eyes evanescent, unpigmented; tubercle absent, AME on common mound. Group 0.42 long, front width 1.07, back width 1.10, occupies ca. 1/3 of headwidth. Sizes and interdistances: AME 0.20, ALE 0.21, PME

absent, PLE 0.14; AME-AME 0.15, AME-ALE 0.08, PLE-PLE 0.77, ALE-PLE 0.08.

Chelicerae porrect, broad, with broad band of stiff black bristles dorsally and narrower band of shorter bristles laterally. Intercheliceral tumescence and rastellum absent; rastellar region with fine bristles only. Furrow promargin with 12(13) teeth, basomesally with 3 tiny denticles. Maxillae broad, 1.64 long in front, 2.40 behind, 1.20 wide, with 21-25 cuspules in small prolateral-proximal corner; heel rounded; anterior lobe indistinct. Serrula region with small low scales. Labium 0.60 long, 1.00 wide; no cuspules.

Sternum 2.60 long, 2.60 wide; sigilla distinct, oval, marginal. Labiosternal suture, two tear-shaped sigilla just touching medially.

Leg formula 4123. Eight thorn spines on ventral and prolateral tibia I. Leg I much thicker than II-IV. Metatarsus I slightly sigmoid. Preening combs absent. Anterior leg tarsi slightly spindle-shaped, all aspinose. Scopula light on tarsi and distal metatarsi of legs I, II. Spines: I, fe p1, d1w, pa 0, ti p2, v4 + 2 megaspines, me 0; II, fe p3, d1w, pa 0, ti p3, v3, me p1, v7; III, fe all weak, p2, d1, r1, pa p1, ti p2, d1, r2, v7, me p4, r4, v6; IV, fe d1, r1, pa r1, ti p3, r2, v7, me p4 r3 v7; palp, fe p1, pa 0, ti p3 v6, cymbium 6. Trichobothria on legs I-IV and palp: tarsi 8-10 in zig-zag row, metatarsi 10-11 in one straight row, tibiae 6-9 in two proximally divergent rows. Paired claws with two rows of 8-11 teeth; unpaired claws bare.

Leg and palp measurements:

	I	II	III	IV	Palp
Femur	4.75	4.25	3.75	4.68	3.06
Patella	2.81	2.31	2.12	2.12	1.75
Tibia	3.94	3.31	2.43	3.50	2.18
Metatarsus	3.31	2.94	3.18	4.50	-
Tarsus	1.87	1.68	1.68	1.87	0.96
Total	16.68	14.49	13.16	16.67	6.03

Palpal tarsus spinose, with two rounded lobes. Bulb pyriform, embolus long and slender, with corkscrew-shaped tip.

PMS small, 0.27 long, 0.13 wide, PLS 2.1 long; apical segment digitiform, 0.87 and 0.45 mid-width, median 0.50, basal 0.77 long.

Paratype female QMS29274: Total length, including chelicera 15, Carapace 4.9 long, 4.0 wide. Abdomen 7.4 long, 4.7 wide. As in ♂ except:

Body generally pale yellow brown, chelicera and sternum slightly darker.

Carapace glabrous with distinct black bristles along margins and on caput. Caput more distinctly raised than in ♂, highest well behind eyes. Fovea slightly procurved, 0.9 wide, occupies 1/4 of carapace width at that point.

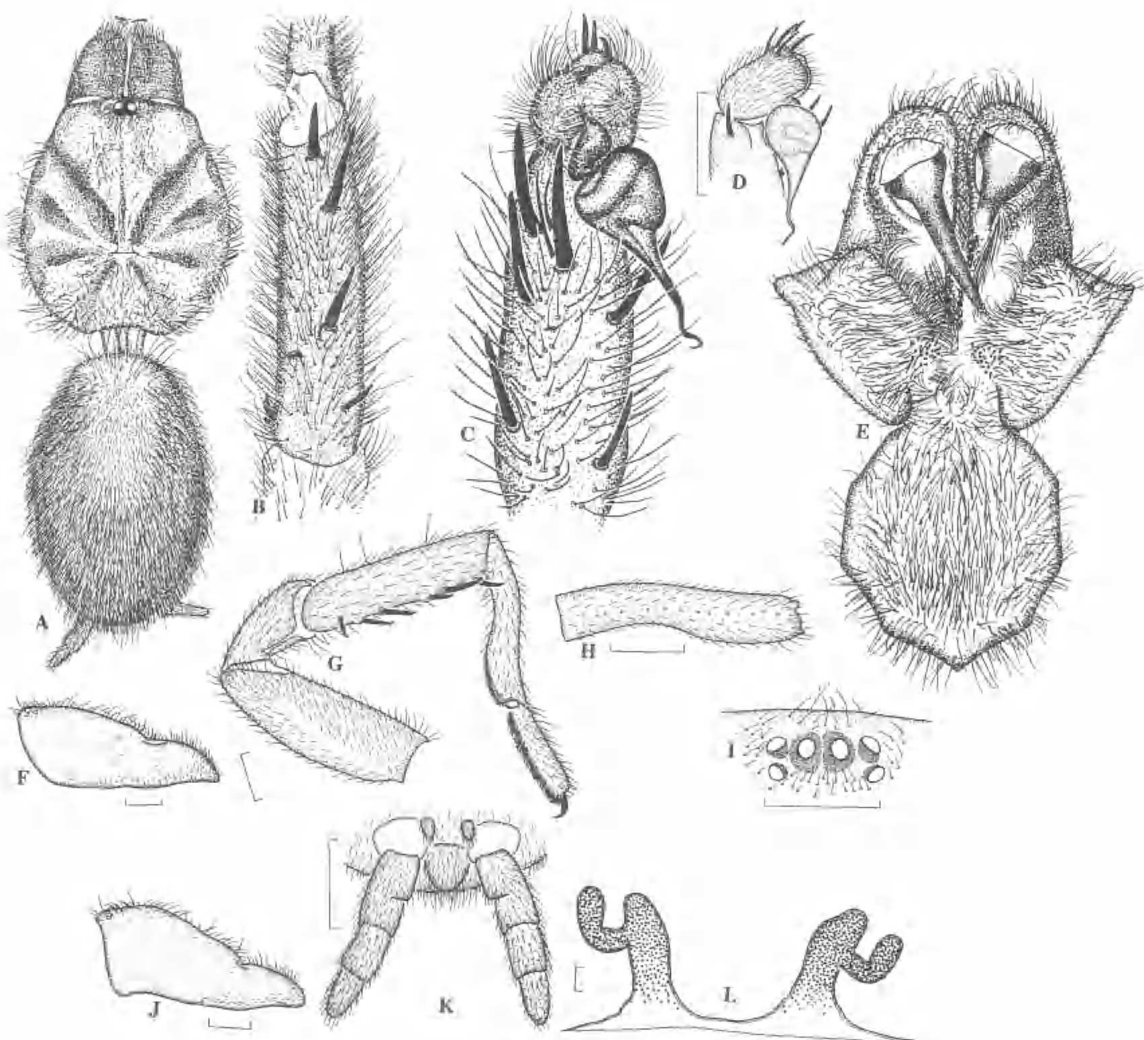


FIG. 6. A-L. *Angka hexops* sp. nov. A-I, ♂. J-L, ♀. A, body (no legs), dorsal view. B, tibia and metatarsus I, ventral right, ventral view. C, D, palpal tibia, tarsus and bulb. C, ventral view. D, prolateral view. E, chelicerae, sternum, maxillae and labium, ventral view. F, carapace, lateral view. G, leg I, ventral right, prolateral view. H, metatarsus I, dorsal view. I, eyes dorsal view. J, carapace, lateral view. K, spinnerets, ventral view. L, spermathecae, dorsal view. Scale lines = 1.0mm (A-K), 0.1mm (L).

Eye group 0.26 long, front width 0.85, back width 0.84, occupies *ca.* 1/4 of headwidth at that point. Only AME distinct; others small, translucent. Sizes and interdistances: AME 0.14, ALE 0.14, PME 0.04, very indistinct and present only

on left side, PLE 0.06; AME-AME 0.09, AME-ALE 0.08, PLE-PLE 0.69, ALE-PLE 0.05.

Chelicerae strong, 2.3 long, no rastellum; furrow with 13 teeth on promargin and 2(3) basomesal denticles. Maxillae 1.2 wide, front length 1.6, back length 2.1, with *ca.* 30 cuspules

on distinct mound on prolateral-proximal corner. Labium 0.5 long, 1.0 wide; no cuspules. Sternum 2.2 long, 2.2 wide. Posterior sigilla distinct, oval, 0.25 long; others indistinct, submarginal.

Leg and palp measurements:

	I	II	III	IV	Palp
Femur	3.5	3.1	2.8	3.7	3.0
Patella	2.1	1.9	1.7	1.9	1.6
Tibia	2.7	2.2	1.9	2.6	1.8
Metatarsus	1.9	1.9	2.3	3.2	-
Tarsus	1.4	1.4	1.4	1.7	1.7
Total	11.6	10.5	10.1	13.1	8.1

Leg formula 4123. All tarsi apinose. Scopula light on tarsi and distal metatarsi of leg I, II. Spines: I, ti v3(4), me v6; II, ti v4, p1(2), me v7, p1; III, ti v4(5), r1(2), p2(3), d1, me v7, r3, p3, d1; IV, ti v6 (weak), r1, p1, d1, me v7, r3, p2(3), d1; palp, ti v6, ta v3. Trichobothria on legs I-IV (palp): tarsi 10-12 (7-8) in a zig-zag row, metatarsi 9-11 in one straight row, tibiae 7-11 (7) in two proximally divergent rows. Claws with two rows of 6-8 cylindrical teeth, confined to basal portion of paired claws; unpaired claws bare. Palpal claw with prolateral row of 6 teeth.

PMS 0.3 long, PLS 1.9 long; apical segment digitiform, 0.6, median 0.5, basal 0.8 long.

Spermathecae two, each divided into short inner lobe and longer, bent outer lobe.

VARIATION

Carapace lengths of ♂, 4.8-6.1 (n=10). Some ♂ have one PLE reduced. The juvenile ♀ shows small pigmentation where the left PME would be situated. In the mature ♀, a reduced cornea of the PME occurs on the left side.

DISTRIBUTION, HABITAT & BURROW

Known only from cloud forest near the summit of Doi Inthanon (2565m), Chiang Mai Province, Thailand. Female and juveniles were found under rotten logs on the forest floor; ♂ were trapped in pitfalls. In captivity, the mature ♀ built a 6cm long burrow without any silk lining. The only silk observed was a thin web spun onto the substratum before the burrow was made. No other specimens were observed to produce silk or construct a burrow. Two possibilities emerge: the spiders may inhabit temporary retreats and possibly forage on the ground. Vagrant females, however, were not caught in any of the 5 pitfalls at the locality during the 14 month study. Or, as in the case of *Xamiatius rubrifrons* Raven, 1981, only small amounts of web may be used to line the burrow (Raven, 1981b).

Family NEMESIIDAE Simon

Subfamily ANAMINAE Simon

Sinopesa gen. nov.

TYPE SPECIES

Sinopesa maculata sp. nov.

DIAGNOSIS

Sinopesa is close to *Entypesa* Simon, 1902, but differs in lacking posterior median spinnerets (Figs 7J, 8B) and a serrula; in ♂, the palpal tarsus is short (Fig. 7D-F), metatarsus I modified (Figs 7K, 8E), and the interchelicerar tumescence is absent.

DESCRIPTION

Carapace glabrous, narrow in front, caput a little higher than thoracic region in ♂ (Fig. 7B), clearly arched and higher in ♀ (Fig. 7C). Eight eyes on low but distinct tubercle. Fovea deep, very narrow, transverse and slightly recurved. Chelicera weak, with teeth only on promargin of fang furrow. Interchelicerar tumescence and rastellum absent. Maxillae long, narrow, with distinct posterior heel and few cuspules on probasal corner, not on mound; no serrula. Labiosternal suture a broad groove. Sternum wide, with small, marginal sigilla (Figs 7M, 8D). Legs long, slender, strongly armed with spines on patellae to metatarsi, except on dorsal side of legs I, II. Leg tarsi apinose. Scopula weak on tarsi I, II and distal metatarsi. No preening combs. Paired claws with 2 rows of several long, cylindrical teeth; unpaired claw bare, quite long and little bent. Tarsal organ low (Fig. 4B-D). Trichobothrial base with transverse ridges confined to upper ledge (Fig. 4B). Leg cuticle with fine scaly sculpture (Fig. 4C, D). Abdomen with or without pattern. PMS absent; PLS long, apical article digitiform (Figs 7J, 8A, B). Males with large spines but no spur on tarsus I; metatarsus I sigmoid, narrowed in its basal half, with one distoventral spine (Figs 7H, K, L, 8E). ♂ palp with spines on tibia and dorsal tarsus. Embolus pyriform, with long, slender, more or less corkscrew-shaped embolus tip (Figs 7D-F, 8C).

ETYMOLOGY

The generic name is an arbitrary combination of letters. The gender is feminine.

INCLUDED SPECIES

Sinopesa maculata sp. nov.

Sinopesa guangxi sp. nov.

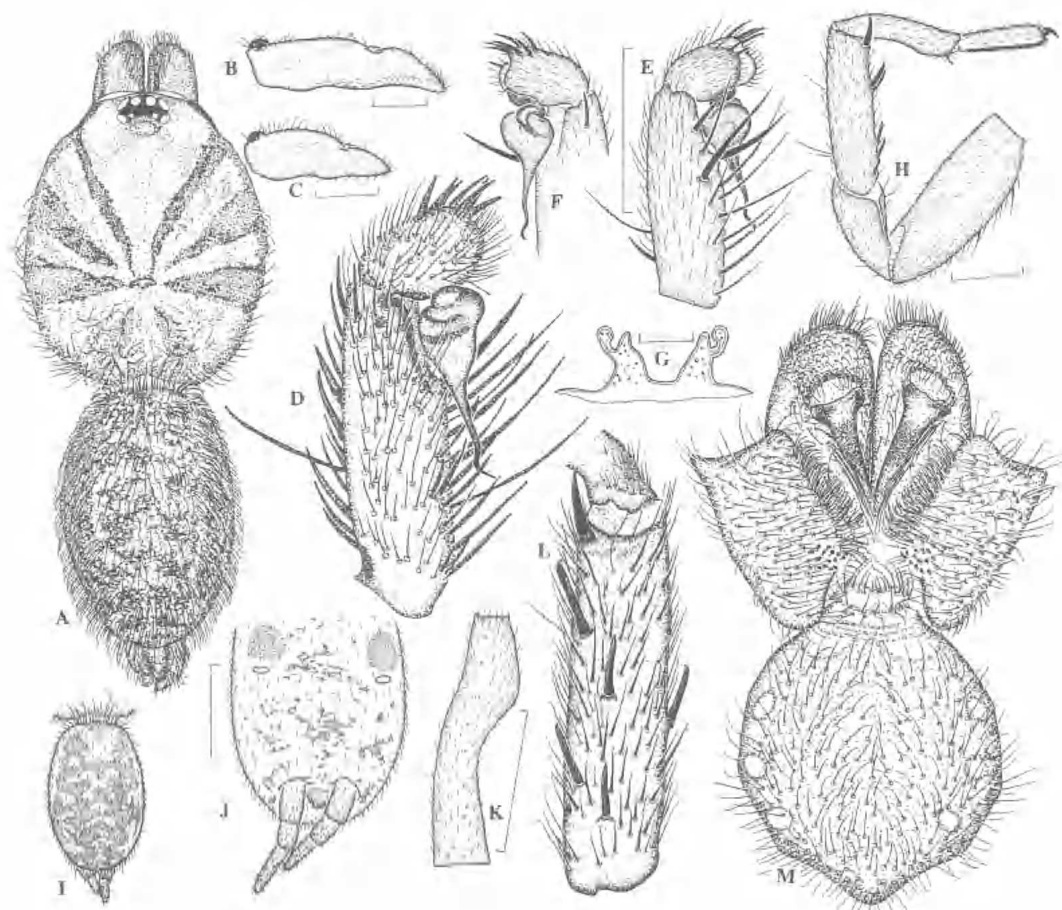


FIG. 7. A-M. *Sinopesa maculata* sp. nov., C, G, I, J, ♀; rest, ♂. A, body no legs, dorsal view. B, C, carapace, lateral view. B, ♂. C, ♀. D, palpal tibia, tarsus and bulb. D, E, retrolateral view, F, prolateral view. G, spermathecae, dorsal view. H, leg I, retrolateral view. I, J, abdomen, ♀. I, dorsal. J, ventral. K, metatarsus I, ♂, dorsal view. L, tibia and metatarsus I, retroventral view. M, chelicerae, sternum, maxillae and labium, ventral view. Scale lines = 1.0mm, except G, 0.1mm.

***Sinopesa maculata* sp. nov.**
(Figs 1, 3B, 4D, 7)

ETYMOLOGY

Latin, *maculatus*, spotted.

MATERIAL EXAMINED

HOLOTYPE: QMS6207, ♂, Doi Inthanon, 18°33'N, 98°28'E, 2300m altitude, Chiang Mai Province, Thailand, 14 Jul-20 Aug 1987; PJS.

PARATYPES: QMS6208, 1 ♀, 23 May 1987; 3 ♂♂, 14 Jul-20 Aug 1987 & 20 Aug-8 Oct 1987, PJS, MHNG, NHMW.

DIAGNOSIS

Males of *S. maculata* are much smaller than those of *S. guangxi* sp. nov., have a dark pattern dorsally and ventrally and the embolus tip is distinctly corkscrew-shaped.

DESCRIPTION

Holotype male QMS6207: Total length, 7.7. Carapace 3.4 long, 3.0 wide. Abdomen 3.4 long, 2.3 wide.

Prosoma, legs and palps brown; abdomen light brown, with dark dorsal and ventral (less pronounced) pattern and dark brown posterior lung covers (Fig. 7J).

Caput low, narrow. Fovea short, slightly re-curved, 0.25 wide, occupies c. 1/12 of carapace width at that point (Fig. 7A).

Eye group on distinct tubercle, 0.31 long, front width 0.61, back width 0.63, occupies slightly less than 1/2 of head width. Sizes and interdistances: AME 0.12, ALE 0.18, PME 0.12, PLE 0.14; AME-AME 0.08, AME-ALE 0.02, PME-PME 0.21, PME-PLE 0.02, ALE-PLE 0.04. MOQ 0.27 long, front width 0.26, back width 0.41.

Chelicerae 0.7 long, no rastellum; furrow with 9(10) teeth on promargin and 5 tiny basomesal denticles. Maxillae 0.6 wide, front length 1.0, back length 1.3, with 14 cuspules at prolateral-proximal corner. Labium 0.2 long, 0.6 wide, no cuspules. Sternum 1.7 long, 1.6 wide. Labiosternal suture a broad groove.

Leg and palp measurements:

	I	II	III	IV	Palp
Femur	2.7	2.3	2.1	2.8	1.7
Patella	1.7	1.4	1.3	1.4	1.0
Tibia	2.1	1.7	1.4	2.2	1.3
Metatarsus	1.8	1.7	2.1	3.0	-
Tarsus	1.1	1.2	1.3	1.4	0.6
Total	9.4	8.3	8.2	10.8	4.6

Leg formula 4123. Six thorn-like spines on ventral tibia I (Fig. 7H, L). Metatarsus I sigmoid, with distinct prolateral flattening distally (Fig. 7K). Preening combs absent. Tarsi aspinose. Scopula very light on metatarsi and tarsi I, II. Spines: I, fe p1, d3, r1, pa 0, ti p3, v5, me p2; II, fe p3, d4, pa p1, ti p3, v6, me p1, v6; III, fe p3, d3, r2, pa p4 r2, ti p3, d2, r3, v8, me p4, r4, v8; IV, fe p2, d3, r1, pa p4, r1, ti p3, d2, r3, v7, me p3, r3, v9; palp, fe p1, d4, pa 0, ti p3, ta 6 apical. Trichobothria on legs I-IV (palp): tarsi 7-8 (6) in a zig-zag row, metatarsi 7-10 in one straight row, tibiae 5-7 (6) in two proximally divergent rows.

Paired claws with teeth in two rows of 4-7; unpaired bare.

Palpal cymbium spinose, with two rounded lobes. Bulb pyriform; embolus long, thin, with spiral tip (Fig. 7D-F).

PMS absent; PLS 1.6 long; apical segment digitiform, 0.5, median 0.4, basal 0.5 long.

Paratype female QMS6208: Total length, including chelicera 6.6. Carapace 2.3 long, 1.9 wide. Abdomen 3.1 long, 1.9 wide. As for ♂ except:

Body generally pale brown, chelicera slightly darker. Abdominal pattern less evident.

Caput more distinctly raised than in ♂ (Fig. 7C). Fovea straight, 0.3 wide, occupies ca. 1/5 of carapace width at that point.

Eye group 0.27 long, front width 0.48, back width 0.48, occupies almost half of head width at that point. Sizes and interdistances: AME 0.08, ALE 0.14, PME 0.10, PLE 0.14; AME-AME

0.08, AME-ALE 0.02, PME-PME 0.16, PME-PLE 0.02, ALE-PLE 0.03.

Chelicerae weak, 0.6 long, no rastellum; furrow with 8 teeth on promargin and 7 tiny basomesal denticles. Maxillae quite narrow, 0.5 wide, front length 0.7, back length 1.0, with 8(9) cuspules at prolateral-proximal corner. Labium 0.2 long, 0.5 wide, no cuspules. Sternum 1.1 long, 1.1 wide.

Leg and palp measurements:

	I	II	III	IV	Palp
Femur	1.6	1.3	1.2	1.6	1.3
Patella	1.1	0.9	0.8	1.0	0.8
Tibia	1.1	0.9	0.8	1.2	0.8
Metatarsus	0.8	0.8	1.0	1.6	-
Tarsus	0.6	0.7	0.7	1.0	0.8
Total	5.2	4.6	4.5	6.4	3.7

Leg formula 4123. Tarsi aspinose. Scopula very light on tarsi of palp and leg I. Spines: I, fe d5 (long stout bristles); II, fe d3 (long stout bristles), me v6; III, fe d3 (long stout bristles), pa p2, r3, ti v7, p2, d4, me v7, p2, d5; IV, fe d3 (long stout bristles), pa p2, r3, ti v7, p2, r2, d1, me v7, p2, d5; palp, fe d2 (long stout bristles), ti v2, ta v2 + several short stout bristles. Trichobothria on legs I-IV (palp): tarsi 5-8 (6) in a zigzag row, metatarsi 6-8 in one straight row, tibiae 5-6 (5) in two proximally divergent rows. Paired claws with 2 rows of 4-6 cylindrical teeth, confined to basal half of claw on posterior legs; unpaired claw long, only slightly bent. Palpal claw with prolateral row of 4 teeth.

PMS absent. PLS 1.3 long; apical segment digitiform, 0.4, median 0.4, basal 0.5 long.

Spermathecae two, triangular, each divided into short pointed inner lobe and longer knob-shaped outer lobe bent forward.

VARIATION

Carapace lengths in ♂ 3.2-3.6, width 2.7-3.1 (n=4).

DISTRIBUTION & HABITAT

Known only from Doi Inthanon, Chiang Mai Province, Thailand at 2000-2300m altitude. Males were trapped in pitfalls and juveniles were found in leaf litter and under rotten wood on the forest floor. The young ♀ kept in captivity constructed no web or burrow.

Sinopesa guangxi sp. nov.
(Figs 1, 3C, 4B, D, 8A-E)

MATERIAL EXAMINED

HOLOTYPE: MCZ, ♂, Dragon Lake, Liuzhou Guangxi, China, Jan 1982, AP.

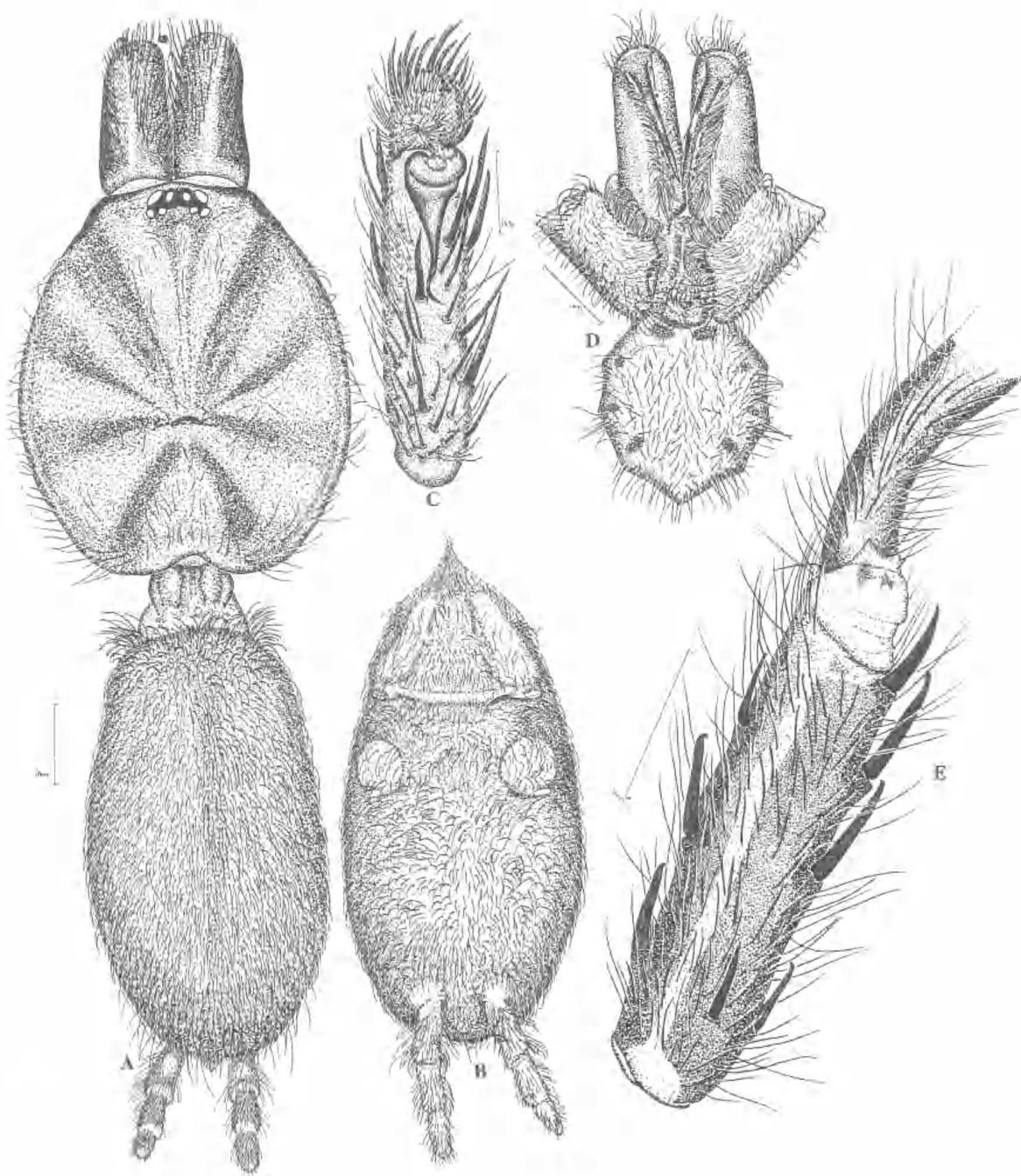


FIG. 8. A-E. *Sinopsea guangxi* sp. nov., holotype ♂. A, Carapace, chelicerae & abdomen, dorsal view. B, Abdomen, ventral view. C, Palpal tibia, tarsus & bulb, ventral view. D, Sternum, maxillae, labium & chelicerae, ventral view. E, tibia & metatarsus I, proventral view.

ETYMOLOGY

For the type locality.

DIAGNOSIS

Larger than *S. maculata*; lacking abdominal pattern, posterior sigilla larger, and embolus tip only slightly corkscrew-shaped. ♀ unknown.

DESCRIPTION

Holotype male: Total length, 12. Carapace 5.31 long, 4.81 wide. Abdomen 5.13 long, 3.00 wide.

Carapace orange brown, legs orange to red-brown. Abdomen dorsally and ventrally pallid yellow-brown, no pattern (Fig. 8A).

Cephalic bristles short on caput and interstrial ridges; long on lateral margins; 4 long on clypeal edge; many anteromedially. Fovea short, shallow, slightly recurved (Fig. 8A). Clypeus absent. Caput elevation low, thorax sloping. Striae distinct.

Eye tubercle low, with almost sessile eyes save AME. Group occupies 2/5 of head-width. Two rows: front row 34, back row 85. Eye group front width, back width, length, 32:34:15. MOQ front width, back width, length, 14:22:13. AME:ALE:PME:PLE, 5:11:6:7. AME-AME, 0.6; AME-ALE, 0.3; PME-PLE, 0.2; PME-PME, 2; ALE-PLE, 0.2.

Chelicerae narrow, porrect, with long bristles. Rastellum absent. Fang smooth. Furrow promargin with 9 teeth, plus 1 small tooth, intermedially with 6-7 fine basally; several deep parallel ridges near intercheliceral tumescence area but not pallid; no teeth on outer margin of furrow.

Maxillae 1.30 long in front, 1.92 long behind, 0.84 wide; with c. 3-4 cuspules along edge. Heel produced over labium; anterior lobes just evident. Serrula absent. Labium 0.82 wide, 0.42 long. Labiosternal suture with 2 double, pallid, lateral areas, not grooved. Labium lacks cuspules; anterior edge indented. Sternum 2.28 long, 2.13 wide; distinct bristles along posterior edge. Sigilla all marginal, oval. Sigilla length, distance to margin: posterior 0.4, 0.16; middle 0.22, 0.16; anterior 0.19, 0.16. No prolateral coxal bristles; inner coxae not produced or angular.

Leg and palp measurements:

	I	II	III	IV	Palp
Femur	3.75	3.44	3.13	4.00	2.5
Patella	2.31	2.06	1.69	2.00	1.5
Tibia	2.94	2.62	2.38	3.50	1.78
Metatarsus	2.69	2.50	3.00	4.31	-
Tarsus	1.56	1.63	1.56	1.81	0.72
Total	13.25	12.25	11.75	15.63	6.50

Leg formula 4123. Setation light brown, adpressed. Tibia I darker and thicker than other

tibiae with ventral spines thicker and 3 on distal portion very raised, bases all movable. Metatarsus I curved for two-thirds of proximal length (Fig. 8E). No preening combs. No scopula on metatarsi; very thin and divided on tarsi I, absent on II-IV. Spines: I, fe p1, d3, r1, pa 0, ti p3, v5, me v1; II, fe p1, d2, pa p1, ti p3, v6, me v6; III, fe p3, d3, r2, pa p2, r1, ti p3, d2, r3, v7, me p6, r3, v7; IV, fe p1, d4, r1, pa p2, r1, ti p3, d3, r3, v6, me p6, r3, v7; palp, fe p1, d3, r1, pa p1, ti p3, r1, v6, ta 10 distally. Paired claws with 2 rows of teeth, 6-7 per row juxtaposed (I), longer on IV than II; on IV, teeth basal on outer face and distal on the inner face; unpaired claw on I hooked, bare, on IV longer, bare. Trichobothria in two rows, each of 11 on tibiae; full curving row of 10-15 on metatarsi; 15 in 2 bands for three quarters of length on tarsi.

Palpal bulb rugose, pyriform; embolus small with distally hooked tip. Tarsus short, with large spines similarly and deeply incised; no scopula. Tibia not incrassate; distal ventrally excavated (Fig. 8C).

PMS absent, without vestige. Length of basal, middle, apical, and total articles of PLS 0.75, 0.50, 0.63, 1.88, respectively; 0.55 apart. Apical segment digitiform. Australotheline crescent absent but sclerotised disc on ventral elastic cuticle between hirsute basal article and abdomen. Booklung apertures broad, ovoid (Fig. 8B).

DISTRIBUTION

Known only from Dragon Lake, Linzhou, Guangxi, China.

Family DIPLURIDAE Simon, 1892

RELATIONSHIPS

As with the Cyrtacheniidae, Goloboff (1993) found that the Dipluridae of Raven (1985) were paraphyletic. However, a possible new genus seen in the MNHN, Paris, is intermediate between Ischnothelinae and Euagrinae and may reduce that paraphyly significantly (Goloboff, pers. comm.).

Main (1993) also attempted to test the synapomorphies of the Dipluridae in establishing the relationships of the cave-dwelling genus *Trogloiplura* Main, 1969 and arrived at the same conclusion as Raven (1985).

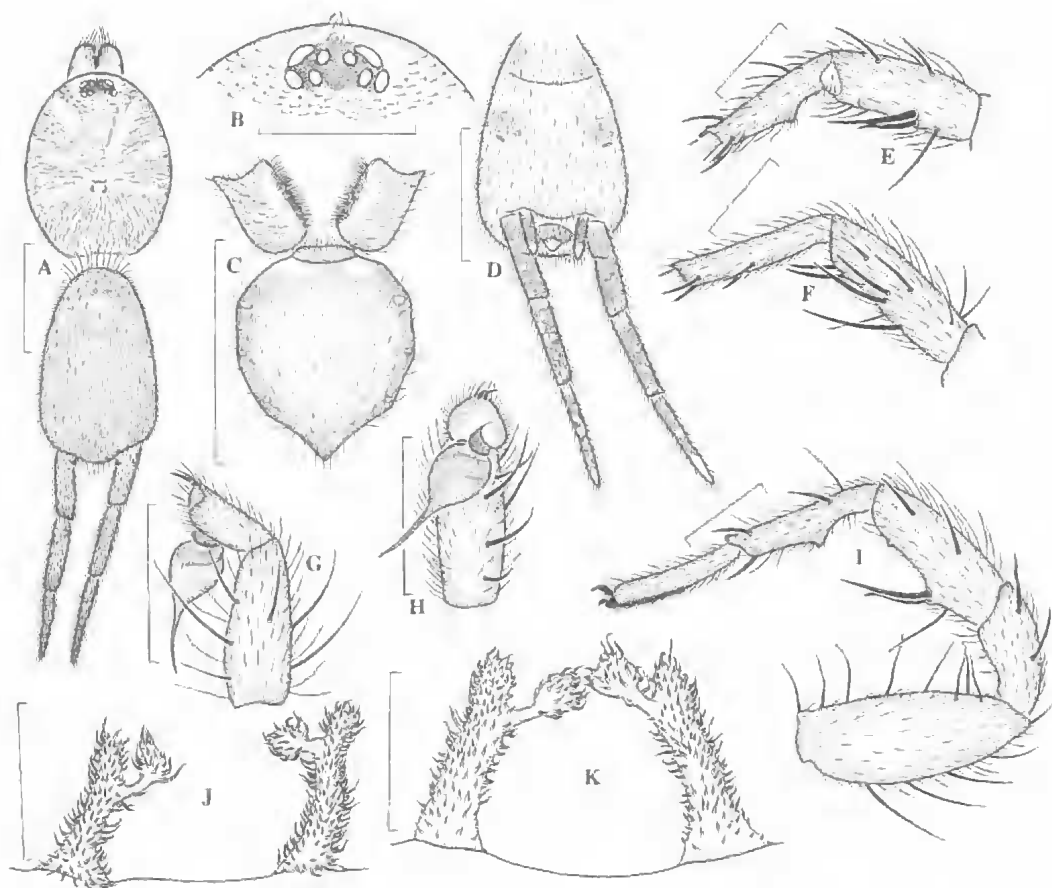


FIG. 9. A-K. *Leptothele bencha* sp. nov. A-H, K, ♂; I, J, ♀. A, body (without legs), ♂, dorsal view. B, eyes, dorsal view. C, maxillae, labium and sternum, ventral view. D, abdomen, ventral view. E, F, Tibia and metatarsus of leg II, retroventral view (E) and leg I, prolateral view (F). G, H, Palp, prolateral (G) and ventral (H) view. I, Leg II, prolateral view. J, K, Spermathecae of two ♀♀, dorsal view. Scale lines = 1mm, except B, E-I 0.5mm, J, K = 0.1 mm.

Subfamily EUAGRINAE Raven, 1985

Leptothele gen. nov.

TYPE SPECIES

Leptothele bencha sp. nov.

DIAGNOSIS

Leptothele is closely related to the genus group *Euagrus* Ausserer, 1875 plus *Phyxioschema* Simon, 1889 (Coyle, 1988), which share interlocking spinule patches on ♂ femora I and II, a median ♂ tibia II mating apophysis with megaspines and pseudosegmented apical articles of PLS. *Leptothele* resembles *Euagrus* Ausserer but differs in a single ventral process on

metatarsus II and a small transverse distal ridge on ventral tibia II of ♂ (Figs. 9E, I); the spermathecae lack sclerotised stalks, scopula light on tarsi I, II of ♂ and leg tarsi in both sexes aspinose. It also resembles *Masteria* in the small size and squat maxillae with glabrous tumid anterior edge but differs in dark pigmentation of the carapace, abdomen, and legs, in a narrow but band-like serrula (Fig. 5F) and in lacking an australotheline crescent.

DESCRIPTION

Tiny euagrine spiders with hirsute carapace and pit-like fovea (Fig. 9A). Eight eyes on tubercle. Chelicera geniculate, teeth only on promargin. Serrula a narrow band 3-5 denticles wide (Fig.

5F). Leg tarsi of both sexes aspinose; δ cymbium apically with cluster of thick dark, spine-like setae. No preening combs. Trichobothrial bases deeply corrugiform, as in *Masteria*; tarsal organ a low dome with concentric ridges (Fig. 4E); leg cuticle smooth. Paired claws with one row of teeth in slight S-shape; unpaired claw with several fine teeth, basally on a single process, distally sessile (Fig. 3E, F). Four spinnerets, PMS widely separated; PLS very long, with pseudosegmented apical joint; no australotheline crescent (Fig. 9D).

Males: tibia I unmodified but armed with thorn spines; tibia II with 2 megaspines on low spur medially and a small transversal ridge distally; metatarsus II bearing pointed ventromedian thorn (Fig. 9E, I); palpal bulb pyriform, with elongated embolus; cymbium dissimilarly lobed and apically with distinctly thick setae (Fig. 9G, H). Interlocking spinules on femora I, II.

Females with two spermathecae, densely covered by small protuberances. Each spermatheca divided in two lobes, the inner one with a narrow but not sclerotised stalk.

ETYMOLOGY

Greek, *leptos* (small, thin, weak) and *ihele*, (wart, nipple = spinneret, in figurative sense). The gender is feminine.

RELATIONSHIPS

Absence of cuspules on maxillae and pseudosegmentation of δ tarsi indicate that affinities of *Leptothele* are clearly within the euagrine+masteriine clade (Raven, 1985, fig. 6). Presence of a spur and megaspines on tibia II and the associated absence of an australotheline crescent unequivocally places *Leptothele* in a trichotomy with *Euagrus* and *Phyxioschema*. However, dentition of the third claw severely tests the notion of the common process on the Masteriinae. At its basal end, the group of teeth resembles that of the Masteriinae—long teeth set on a broad base off the claw, whereas the base of the distal tooth is clearly on the claw (Fig. 3F). No doubt similar problems arise in determining the cheliceral dentition in plurident and fissident salticids.

Since Raven (1985), two new diplurid genera have been described. Of those, only *Chilehexops* Coyle, 1986 need be considered further. The trichobothrial bases of *Chilehexops* are unlike any other diplurids in that they lack the multiple longitudinal corrugations so well developed in *Masteria* (Raven, 1979; fig. 21). The segments of the posterior lateral spinnerets are more nemesoid in relative size—the apical segment is barely as

long if not shorter than the median segment. As Coyle (1986) noted, *Chile hexops* genus shows no close relationships with any known euagrine genus and may represent a separate clade within the Dipluridae where its inclusion requires another character change (spinneret relative length reversal) and a weakening homoplasy in the synapomorphies proposed by Raven (1985). In any case, it does not affect the position of *Leptothele* in the Dipluridae.

Leptothele bencha sp. nov.

(Figs 1, 2C, 3E, F, 4E, 5F, G, 9A-K)

MATERIAL EXAMINED

HOLOTYPE: QMS29275, δ , Khao Phanom Bench National Park, 8°15'N, 98°55'E, 260 m altitude, Krabi Province, Thailand, 21 Sep 1992, PJS. PARATYPES: QMS29276, MHNG, NHMW, 1 δ (matured 22 Oct 1992), 4 δ ♀, data as for holotype.

ETYMOLOGY

For the type locality.

DIAGNOSIS

As for genus.

DESCRIPTION

Holotype male: QMS29275. Total length 3.7, Carapace 1.49 long, 1.33 wide. Abdomen 1.74 long, 1.07 wide.

Carapace brown, mottled with dark brown on cephalic and coxal areas. Abdomen dorsally dark brown, apart from light anterior patch, densely covered with small grey hairs and few interspersed long setae in the anterior part. Legs and chelicerae light brown dorsally. Ventral side of body yellow brown. Spinnerets dark brown, with light ventral spots. In life, the spinnerets have a conspicuous white ventral side, like an icing, which is lost in alcohol.

Carapace oval, almost flat, highest near fovea, covered with fine brown hairs; setae absent. Fovea a deep pit, occupies ca. 1/10 of carapace width at that point (Fig. 9A).

Eyes on dark raised tubercle; two rows, front row slightly procurved, back row indistinctly recurved. Group 0.14 long, front row 0.31 wide, back row 0.34 wide, occupies slightly more than 1/3 of carapace width at that point. Sizes and interdistances: AME 0.06, ALE 0.10, PME 0.07, PLE 0.08; AME-AME 0.04, AME-ALE 0.01, PME-PME 0.11, PME-PLE 0.02, ALE-PLE 0.02.

Chelicerae small, 0.29 long, geniculate, with dorsal setae projecting anteriorly. No inter-

cheliceral tumescence. Fang groove with 11 teeth on promargin and with 6-7 tiny median denticles (granules). Maxillae 0.24 wide, 0.37 long in front, 0.40 behind. No cuspules or anterior lobe. Glabrous tumid area along proventral margin. Serrula a band 3-5 denticles wide (Fig. 5F). Labium 0.09 long, 0.30 wide. No cuspules. Anterior edge with setae and transverse glabrous tumid area. Sternum 0.88 long, 0.79 wide, cordate, covered with long setae. Sigilla indistinct, marginal. Labiosternal suture a broad groove.

Leg and palp measurements:

	I	II	III	IV	Palp
Femur	1.25	1.19	1.11	1.40	0.75
Patella	0.73	0.66	0.58	0.66	0.44
Tibia	0.92	0.84	0.78	1.13	0.52
Metatarsus	0.90	0.87	1.01	1.33	-
Tarsus	0.67	0.69	0.69	0.79	0.34
Total	4.47	4.25	4.17	5.31	2.05

Leg formula 4123. Legs covered with fine brown hairs and setae. Preening combs absent. Patch of spinules on retrodorsal femur I and prodorsal femur II form interlocking mechanisms. Ventral and prolateral tibia I with 9 long thick spines; coupling spur absent (Fig. 9F). Ventral tibia II with 2 megaspines on low median process (indistinct spur) and low transverse distal ridge. Ventral metatarsus II with short anteriorly inclined process like a cuticular thorn (Fig. 9E, K). Scopula weak on tarsi I, II. Spines: leg tarsi aspinose; I, fe d6 long, pa v4, ti p2, v7, me v4; II, fe d6 long, pa v4 (weak), ti p2, v1+2 megaspines, me p2, v2; III, fe d8 long, pa d5, r1, v3, ti d5, p2, r2, v6, me d4, p1(2), v6(7); IV, fe d8 long, pa d4, r1, v3, ti d5, p2, r3, v6, me d7, p2, r1, v5. Palp: fe d6 long, pa d3, ti d3, p2, v4, ta d2(3). Trichobothria discernible only with difficulty. About 5 in two rows on tibiae, 4-7 in one row on metatarsi and tarsi.

Paired claws with ca. 9 teeth in one sigmoid row; 3-5 needle-like teeth on unpaired claw and heel-like process below (Fig. 3E, F).

Palp. Cymbium dissimilarly lobed, retrolateral lobe more pointed and longest, bearing 2-3 short, terminal spines. Bulb pyriform, embolus long and tapering (Fig. 9G, H).

PMS 0.32 long, 0.08 wide, 0.32 apart; PLS 2.17 long, articles: basal 0.66, median 0.67, apical pseudosegmented 0.84 long, mid-diameter of basal article 0.18, of apical 0.09. Australotheline crescent absent (Fig. 9A, D).

Paratype female: QMS29276. Total length 4.8. Carapace 1.85 long, 1.46 wide. Abdomen 2.34 long, 1.63 wide. As for ♂ except:

Posterior portion of ventral abdomen darker than anterior.

Carapace hair cover more dense than in ♂; a pair of long bristles in front of fovea, one long sigmoid bristle in front of PME. Fovea occupies 1/12 of carapace width at that point.

Eyes group 0.20 long, front row 0.34 wide, back row 0.37 wide, occupies slightly more than 1/3 of carapace width at that point. Sizes and interdistances: AME 0.07, ALE 0.14, PME 0.08, PLE 0.10. AME-AME 0.04, AME-ALE 0.02, PME-PME 0.12, PME-PLP 0.02, ALE-PLP 0.02.

Chelicerae 0.38 long. Fang groove with 12 teeth on promargin and with 9-12 tiny median denticles (granules). Maxillae 0.38 wide, anterior length 0.50, posterior length 0.58. Labium 0.12 long, 0.40 wide. Sternum 0.99 long, 0.93 wide.

Leg and palp measurements:

	I	II	III	IV	Palp
Femur	1.27	1.22	1.16	1.42	0.91
Patella	0.76	0.73	0.67	0.76	0.55
Tibia	0.88	0.78	0.76	1.05	0.63
Metatarsus	0.84	0.79	0.91	1.17	-
Tarsus	0.56	0.56	0.64	0.64	0.69
Total	4.31	4.08	4.14	5.04	2.78

Leg formula 4132. No spinules on femora I, II. Scopula absent. Spines: leg tarsi aspinose; I, fe d6 long, pa v3 weak, ti p2, v4, me v3(4); II, fe d6 long, pa v4(5) weak, ti p3, v4, me p2, v4(5); III, fe d8 long, pa d4, r1, v3(4) weak, ti d3(4), p2, r2, v5(6), me d4, v5(7); IV, fe d9 long, pa d3, r1, v3 weak, ti d3, p2, r3, v5, me d4, p2, r1, v5. Palp: fe d5 long, ti v6, ta v6. Trichobothria discernible only with difficulty. About 6-7 in two rows on tibiae, 5-6 in one row on metatarsi and tarsi. Paired claws with 9-14 teeth in one sigmoid row, decreasing in size posteriorly; 13 (14) on palp, and ca. 5 needle-like teeth on unpaired claw.

PMS 0.43 long, 0.12 wide, 0.47 apart; PLS 2.22 long, articles: basal 0.69, median 0.69, apical, pseudosegmented, 0.84 long, mid-diameter of basal article 0.23, of apical 0.14.

Spermathecae two, each divided in two anterior lobes; inner lobe, knob-like, its stalk narrow, smooth and not sclerotised; all with dense cover of small pointed protuberances (Fig. 9I, J).

VARIATION

Body measurements (♂, n=2, ♀n=4): total length (including chelicerae) 4.41-4.97, 4.8-6.1, carapace length 1.83-2.09, 1.9-2.0, carapace width 1.46-1.65, 1.4-1.6. One ♀ lacks one PMS, in another the fovea is short, straight, and transverse.

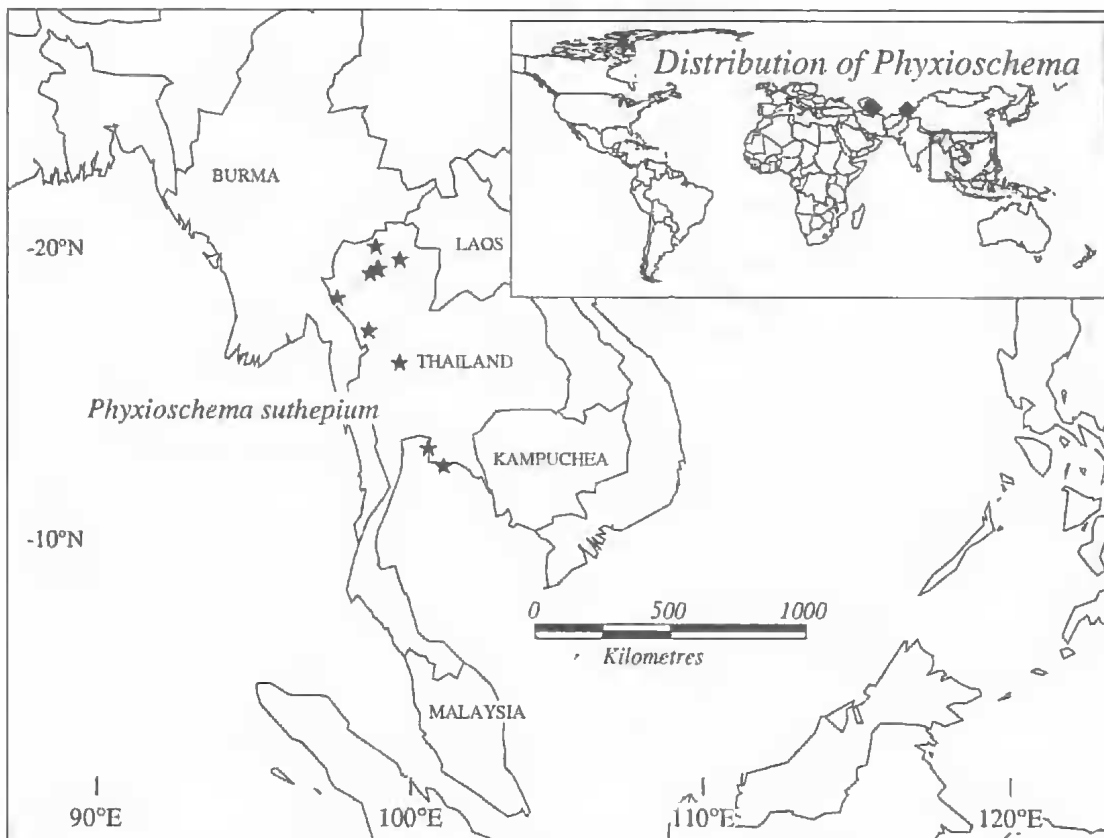


FIG. 10. Occurrence of *Phyxioschema suthepium* Raven & Schwendinger in Thailand; and of *Phyxioschema* (inset).

DISTRIBUTION & NATURAL HISTORY

Khao Phanom Bencha National Park, covering an isolated mountain near the west coast of southern Thailand. Spiders were found on slopes along a stream in semi-evergreen rainforest at altitudes of 250-280m. They live in small funnel-shaped webs, like those of *Phyxioschema suthepium*, under debris and in crevices on the forest floor.

One mature ♂ was taken from the forest in late September, another matured in captivity one month later. Females moult twice per year; moulting data: 25 Sep and 17 Jan (1st), 26 Nov and 16 Jan (2nd), 9 Oct (3rd), 18 Jan (4th), 20 Mar (5th ♀). One ♀ built its first lenticular egg case suspended in the web on 24 Sep (12 spiderlings hatched 6 Sep), its second in Oct (9 eggs) and its third on 12 Nov (5 spiderlings hatched 3 Jan); two other females had 16 and 13 eggs in their first egg case. Mating in captivity was not observed.

Phyxioschema Simon

Phyxioschema suthepium Raven & Schwendinger (Figs 10, 11A-F)

Phyxioschema suthepia Raven & Schwendinger, 1989, p. 55 (emended to *suthepium* by Platnick, 1993, p. 91.)

REMARKS

The diagnostic character "3 megaspines on ventral spur of ♂ tibia II", first given (Raven & Schwendinger, 1989) to distinguish *P. suthepium* from *P. raddei* Simon, is intraspecifically variable. Among 48 ♂ later re-examined, two had three megaspines on one side, and only one had three on both sides (Figs 11B-D); all others have only two megaspines (Fig. 11A). Three megaspines in *P. suthepium* males, thus is the rarer of two states. Other characters given in the description, however, sufficiently support *P. suthepium*.

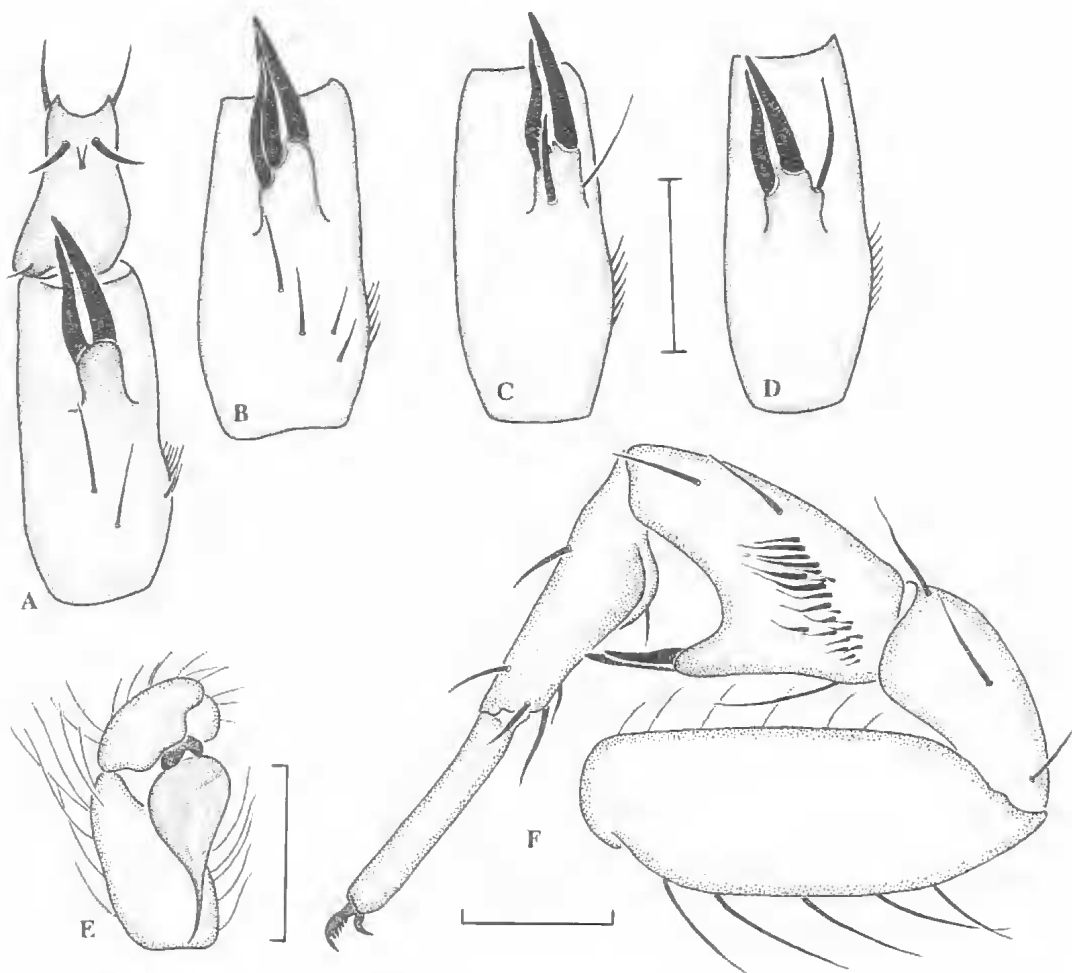


FIG 11. A-F. *Physioschema suthepium* Raven & Schwendinger. A, normal type of ♂ tibia and metatarsus II, ventral view. B-D, variation in number of megaspines on ♂ tibia II, ventral view. E, palp, retroventral view. F, leg II, prolateral view. Scale lines = 0.5 mm.

DIAGNOSIS (EMEND.)

P. suthepium differs from *P. raddei* in lacking foveal setae and having metatarsal preening combs on legs II-IV. Males with two rounded instead of three sharp ventral keels on proximal metatarsus II; 2-3 megaspines on tibia II.

DISTRIBUTION & NATURAL HISTORY

New records from the provinces Mae Hong Son, Nakhon Sawan, Choburi and Rayong indicate that *P. suthepium* occurs widely in lowlands (altitudes 30-750m) of northern, southeastern and central Thailand (Fig. 10).

One ♂, which matured on 19 Dec 1989, attempted a surplus moult on 5 May 1990. The exuvium was not completely shed, as the ster-

num detached from the coxae, and the spider died in the process. Supernumerary ecdysis in mature ♂♂ may be the result of exceptional longevity due to conditions in captivity.

ACKNOWLEDGEMENTS

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